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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/750,576	12/28/2000	Heu-Gon Kim	5000-I-181	6522

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EXAMINER

CHANG, AUDREY Y

ART UNIT PAPER NUMBER

2872

DATE MAILED: 02/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/750,576	KIM ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
 Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on ____.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-7 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-7 is/are rejected.
 7) Claim(s) ____ is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 11) The proposed drawing correction filed on ____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ .
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ .	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The abstract of the disclosure is objected to because it contains language such as "Disclosed is" that is not precise. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. **Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

The term "lens filed" recited in claim 1 is indefinite since it is not clear if this refers to a lens or a field of a lens, which are different. The term "field lens" however is well defined in the art it is not clear if "field lens" is intended as limitation here.

The phrase "a cycle of the optical fiber grating" and the phrase "a cycle of the amplitude mask" recited in claim 1 are indefinite since it is not clear what is a "cycle" of the grating or of the mask referred to. The word "cycle" generally refers to a "regularly repeated event or sequence of events" it is not clear what are the "events" referred here for the grating and mask. A diffraction grating however in general has a pattern of regularly arranged grooves or stripes and a mask generally has a pattern of regularly arranged dark and transparent regions. The repetition of these grooves, stripes or dark/transparent regions is

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referred in the art as “periodicity” or as “pitch”. Also it is not clear what is the relationship between the “cycle” and the “width of each stripe pattern”.

The phrase “a third step … with the longitudinal ratio set in the second step” recited in claim 1 is indefinite and confusing since it is not clear how exactly is the relationship between the longitudinal ratio and the transverse ratio.

The phrase “the injecting surface of the mask” recited in claim 1 is indefinite since it lacks proper antecedent basis from earlier part of the claim.

The phrase “the pattern of an optical distribution on the injecting surface of the mask” recited in claim 1 is indefinite and confusing since it is not clear what does it mean.

The phrase “the slit width of the amplitude mask” recited in claim 7 is indefinite since it lacks proper antecedent basis from its based claim.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors. The applicant is respectfully requested to clear out ALL the discrepancies whether being pointed out by the examiner above or not and to make the claims in comply with the requirement of 35 USC 112.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

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The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-7 are rejected under 35 U.S.C. 102(e) as being anticipated by the patent issued to Jang (PN. 6,201,911).

Jang teaches an apparatus and method for manufacturing a long-period fiber grating wherein the apparatus comprises a *ultraviolet light source* (100) for generating a UV light, a cylindrical lens (104) and a concave lens (106) together serve as the *lens field* for converging the UV light from the source and an *amplitude mask* (108) for selectively transmitting the UV light onto an optical fiber (112), (please see Figure 1, columns 4-5). Jang teaches that the amplitude mask has a defined period as shown in Figure 2. Jang also teaches that the apparatus is arranged to have the distance between the converging point of the concave lens and the amplitude mask designated as “x” and the distance between the amplitude mask and the optical fiber designated as “y”, (please see Figure 3 and column 5, lines 51-67). This means the claimed *longitudinal ratio* is well defined as $x/(x+y)$. Jang then teaches that the period for the grating formed on the optical fiber can be determined by equation (3), which is proportional to the period of the amplitude mask. The claimed *transverse ratio* (Λ_0/Λ), which is the ratio between the period of amplitude mask (Λ_0) and the period of the grating (Λ), is equal to the longitudinal ratio $x/(x+y)$, as indicated in equation (3). The grating and the stripe pattern with the defined periodicity are then determined by the geometry of the manufacturing apparatus. The amplitude mask implicitly has certain thickness and the pattern of the grating on the optical fiber certainly is matched up with the pattern of the mask.

With regard to claim 2, Jang teaches that the UV laser light source is an *excimer laser source*, (please see column 3 line 7).

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With regard to claim 3, Jang teaches that the lens filed consists of a *cylindrical lens* (104) and a *concave lens* (106), (please see Figure 1 and columns 4 and 10). With regard to claim 4, it is implicitly true that the converging point of the lens field may be adjusted by varying the distance between the two lenses.

With regard to claims 5 and 6, exposing the amplitude mask with the UV light forms the fiber grating.

With regard to claim 7, Jang teaches that the period of the amplitude may be 420 μm , which is greater than the wavelength of UV light in the range of 300 nm (please see column 6, line 28).

This reference has therefore anticipated the claims.

7. Claims 1-2 and 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by the patent issued to Bhatia et al (PN. 6,269,208).

Bhatia et al teaches an *apparatus and method* for photo-inducing a fiber grating in a waveguide wherein the apparatus comprises a *ultraviolet light source* (16) for generating a UV light, a lens system (24) serves as the *lens field* for converging the UV light form the source and an *amplitude mask* (120) for selectively transmitting the UV light onto a waveguide (128), (please see Figures 1 and 4, columns 3-4 and 6-7). Bhatia et al teaches that the amplitude mask has a defined period as shown in Figure 4. Bhatia et al also teaches that the apparatus is arranged to have the distance between the converging point of the lens system and the amplitude mask designated as “ Z_A ” and the distance between the amplitude mask and the waveguide designated as “ d_A ”, (please see Figure 4 and column 7, lines 10-25). This means the claimed *longitudinal ratio* is well defined as $Z_A/(d_A + Z_A)$. By simple geometrical calculation, the period for the grating formed on the waveguide can be determined and it is proportional to the period of the amplitude mask. In fact, the claimed *transverse ratio* (Λ_0/Λ), which is the ratio between the period of amplitude mask (Λ_0) and the period of the grating (Λ), is equal to the longitudinal ratio $Z_A/(d_A + Z_A)$.

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The grating and the stripe pattern with the periodicity are then determined by the geometry of the apparatus. The amplitude mask implicitly has certain thickness and the pattern of the grating on the optical fiber certainly is matched up with the pattern of the mask.

With regard to claim 2, Bhatia et al teaches that the UV laser light source is an *excimer laser* source, (please see column 3 lines 59-65).

With regard to claims 5 and 6, exposing the amplitude mask with the UV light forms the fiber grating.

With regard to claim 7, Bhatia et al does not teach explicitly about the size of the periodicity of the amplitude in comparison with the wavelength of the writing UV laser light. However it is implicitly true that the periodicity must be greater than the wavelength in order to photo-inducing the mask pattern on the waveguide without causing the UV light passing through the mask to interfere with each other.

This reference has therefore anticipated the claims.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Bhatia et al.**

The apparatus and method for photo-inducing a fiber grating in a waveguide taught by Bhatia et al as described for claim 1 above has met all the limitations of the claims. Bhatia et al teaches that the lens system includes a *cylindrical lens* (24, Figure 1), but it does not teach explicitly that it also includes a concave lens. However Bhatia et al teaches specifically that the pitch spacing of the resulting grating on

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the waveguide is controlled by the rate of divergence of the amplitude mask and the distance between the waveguide and the mask, (please see column 7, lines 10-15). It would then have been obvious to one skilled in the art to add additional optical element to control the divergence of the light through the mask for the benefit of obtaining desired pitch for the grating on the waveguide. A concave lens is a well-known optical element that adds divergence to the light beam. It would therefore have been one of the obvious options and design choices to one skilled in the art to design the apparatus to obtain desired grating pitch. Furthermore, it has been held when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. *In re Aller*, 105 USPQ 233. With regard to claim 4, it is implicitly true that the converging point of the lens field may be adjusted by varying the distance between the two lenses.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. **Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 10 of U.S. Patent No. 6,201,911.** Although the conflicting claims are not identical, they are not patentably distinct from each other because they essentially disclose the same apparatus and method implicitly included for manufacturing a fiber grating using ultraviolet laser light source and an amplitude mask.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

*Audrey Y. Chang
Primary Examiner
Art Unit 2872*

A. Chang, Ph.D.
February 1, 2002

